

DIAZINON AND PESTICIDE-RELATED TOXICITY IN SAN FRANCISCO BAY AREA URBAN CREEKS TMDL PROJECT PLAN

Waterbody: Bay Area Urban Creeks
Pollutant: Diazinon
Beneficial Uses: Cold freshwater habitat (COLD), warm freshwater habitat (WARM)
Water Quality Objectives: Toxicity
Receiving Water: San Francisco Bay
TMDL Completion Date: June 2003
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Major Milestones, Products, and Completion Dates

Milestone/Product	Fiscal Year	Completion Date
Draft Problem Statement	00-01	November 2000
Draft Source Analysis	01-02	July 2001
Draft Numeric Targets	01-02	March 2002
Preliminary TMDL Project Report	02-03	September 2002
Final TMDL Project Report	02-03	March 2003
Draft Basin Plan Amendment	02-03	April 2003
Basin Plan Amendment	02-03	June 2003

Approach:

The *problem statement* for this TMDL relies on data collected from representative urban creeks to characterize other urban creeks throughout the Bay Area. Samples of Bay Area urban creek water have often been found to be toxic to the standard laboratory test organism *Ceriodaphnia dubia*. Much of the toxicity has been linked to diazinon, an organophosphorus pesticide. Diazinon levels in urban creeks often exceed water quality criteria developed by the California Department of Fish and Game.

The Basin Plan names 37 creeks that carry urban runoff to San Francisco Bay and that support beneficial uses related to aquatic life. These creeks are formally considered “impaired.” However, because sources of pesticide runoff are similar throughout urban watersheds, all Bay Area urban creeks are regarded as potentially impaired for TMDL purposes. Efforts to reduce pesticide discharges are likely to be regional in nature; therefore, efforts to address the formally impaired creeks will also address all other urban creeks.

The *numeric targets* under consideration for this TMDL address diazinon concentrations and

aquatic toxicity. The diazinon concentration targets are based on the water quality criteria developed by the California Department of Fish and Game, and the toxicity targets are derived from the Basin Plan’s narrative water quality objective for toxicity. The targets are intended to ensure the attainment of water quality standards.

The *source analysis* for this TMDL explains that storm drains discharge essentially all the diazinon found in urban creeks. Rather than seek exhaustive detail regarding the diazinon discharged from particular storm drains into particular creeks, the analysis focuses on identifying the factors that contribute to pesticide runoff and the parties responsible for these discharges. For example, the U.S. Environmental Protection Agency registers pesticides for use in urban areas, but does not ensure that such use will not result in water quality impairment.

Because the links between storm drains and diazinon levels (and toxicity) in surface water are relatively straightforward, fewer resources are being allocated to the *linkage analysis*. Similarly, with storm drains

being essentially the only source of pesticides in Bay Area urban creeks, fewer resources are being allocated to the **load allocations**. Instead, more resources are being allotted to developing an effective **implementation plan**. The plan will identify actions various parties will undertake to protect water quality and to promote the use of alternative strategies that are less toxic than conventional pesticides, such as Integrated Pest Management (IPM). IPM is a pest control strategy that uses pest prevention and monitoring to determine when treatment is needed. It employs non-chemical controls before resorting to conventional pesticides. IPM will be the foundation of the TMDL implementation plan.

The diazinon TMDL involves close coordination with several Regional Board programs, including the Surface Water Ambient Monitoring Program, the Non-Point Source Program, the National Pollutant Discharge Elimination System (NPDES) Wastewater Program, and especially the NPDES Storm Water Program.

Issues:

Diazinon Phase-Out. The U.S. Environmental Protection Agency has recently begun to cancel registrations for diazinon products intended for urban use. Sales of diazinon for urban applications will cease at the end of 2004. (Many agricultural products will continue to be registered.) Because diazinon has enjoyed a major share of the urban pesticide market, phasing it out is resulting in important market changes. The diazinon TMDL will seek to ensure that diazinon no longer impairs Bay Area urban creeks and that the pesticides replacing diazinon in the marketplace do not also pose their own substantial water quality risks. Some of the pesticides being studied include bifenthrin, cyfluthrin, cypermethrin, deltamethrin, esfenvalerate, permethrin, pyrethrins, carbaryl, malathion, and imidacloprid.

Regulatory Challenges. Implementing this TMDL is likely to involve many organizations, including federal, state, and local agencies. In California, the U.S. Environmental Protection Agency's Office of Pesticide Programs and the California Department of Pesticide Regulation register pesticides for manufacture and sale. These agencies implement pesticide laws, such

as the Federal Insecticide, Fungicide, and Rodenticide Act and California Food and Agriculture Code. However, as is evident by the impairment of Bay Area urban creeks, these laws do not guarantee compliance with the requirements of the federal Clean Water Act (overseen by the U.S. Environmental Protection Agency's Office of Water and the Regional Board) and the Porter-Cologne Water Quality Control Act (overseen by the Regional Board). This TMDL is intended to ensure compliance with these laws.

Urban Runoff Management. Local storm water programs are responsible for storm drain discharges through their municipal storm water NPDES permits. However, federal and state pesticide laws withhold from local government the authority to regulate pesticide sales and use. Nevertheless, storm water programs can implement measures to minimize pesticide discharges, including controlling pesticide use in municipal operations or on municipal property, coordinating with local household hazardous waste programs to ensure proper pesticide disposal, and monitoring pesticide and toxicity levels in urban creeks. Most importantly, however, storm water programs can implement education and outreach programs that promote IPM.

Stakeholder Participation:

Parties interested in the diazinon TMDL receive regular updates at Urban Pesticide Committee (UPC) meetings. The UPC includes representatives from the U.S. Environmental Protection Agency, the California Department of Pesticide Regulation, storm water agencies, wastewater treatment agencies, independent consultants, environmental organizations, and others. The UPC addresses a broad range of issues pertaining to pesticides and water quality.

Individuals and organizations interested specifically in the diazinon TMDL receive occasional updates, including draft reports. Periodically, stakeholders are invited to presentations about the status of the TMDL. As schedules permit, meetings are held with individual stakeholders, such as storm water management agencies, pest control operators, and county agricultural commissioners.